

HOW THE BLIND SENSE OBSTACLES

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AMERICAN FOUNDATION
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How the Blind Sense Obstacles

THEY ARE FIRST WARNED BY REFLECTED sound, and then a sensation due to the movement of the fine hairs on the skin gives additional notice of the approach of danger.

This conclusion has been reached by Dr. Vladimir Dolansky, of Warsaw, Poland, after several years of experiment.

Dr. Dolansky has been blind since he was ten.

Previous theories suppose the blind have some special sense, but Dr. Dolansky believes his experiments prove this hypothesis unnecessary.

He writes in *And There Was Light* (New York):

"The blind agree on the fact that when approaching an obstacle they have a slight sensation, very difficult to define, of being grazed on the face, and particularly on the forehead, the temples, and the cheeks.

"This incomprehensible phenomenon has aroused great in-



Courtesy of the American Braille Press, Inc.

Testing the Blind's Sense of an Approaching Object

Dr. Dolansky's apparatus.

terest, not only among the blind but also among those who can see.

"This has led to the setting up of: (1) the Truschel acoustic theory; (2) the Kuntz theory of pressure; and (3) the Krogius thermic theory.

"Truschel observes that the modification in noise, caused by the reflection of the sound waves (for instance, the noise of footsteps), warns the blind person of the presence of the obstacle.

"Kuntz asserts, after numerous experiments, that the subject who moves toward the obstacle feels on his face a pressure exerted by the air between him and the obstacle.

"He eliminates hearing from the phenomenon of sensing obstacles, which he includes among the skin senses, and which he calls 'distance touch.'

"Krogius emphasizes thermic influences. According to him, the blind person perceives the obstacle owing to the difference in temperature between the skin of his face and the surface of the object.

"It may be observed with reason that, under certain strictly defined conditions, each of these theories has points in its favor; none of them, however, furnishes a satisfactory solution."

DR. DOLANSKY now relates his own experiences. Since he lost his sight in an accident, he had endeavored to find an explanation. What is this sensation of being lightly grazed which he felt on his face at the moment when he was placed before an obstacle? He goes on:

"This sensation was so short in duration, so transient and strange in character, that I did not realize exactly whether it was an illusion or a real thing. Out of curiosity, I began to observe myself. Very gently, on tiptoe, holding my breath, I would move toward an object, but the sensation was irregular, and

did not always occur when desired. However, I gradually noticed that these sensations never appeared when I knew where the obstacle was and, inversely, they always occurred when I was unexpectedly brought up against an object.

"Later on, when I grew up, I became familiar with the theories set forth above, but none of them satisfied me. So I set to work to discover the actual cause of the phenomenon.

"My subjects, whose faces were always covered with a cardboard mask, clearly felt, in absolute silence, the drawing near of the obstacle and, inversely, they felt nothing at all when their ears were stopt up with cotton wool. These results proved that the assertions of writers who explain the capacity of perceiving obstacles by the tactile and thermic senses have no foundation. However, in order to solve the problem definitely, I resorted to the latest discoveries in physics and aerodynamics which bear upon the subject of our controversy.

"Both the blind and the seeing have the same disposition for movement and action, altho, in the former, it can not be developed as fully as in the latter. For the blind, moving from one place to another is forbidden and longed-for fruit, the indulgence in which is frequently followed by punishment.

"It is natural that the foreboding of evil should give rise to a feeling of fear. From the moment the blind person becomes conscious of it, a complicated process takes place in his mind, where two sentiments enter into conflict; the desire for movement and action caused by vital needs, and the fear of nebulous and unknown consequences.

"The slightest noise, the lowest murmur, the echo brought by the wind, all act as a brake on the progress of the blind, and so operate to decrease the force of any collisions.

"At the same time, the face, the temples, and the forehead feel a slight rustling, which is independent of the actual presence of the obstacle.

"It is sufficient that there be a slope to the ground, that a plank should yield to one's footsteps unexpectedly, for the same cold current to go through the legs and the whole body.

"The source of these sensations, which appear distinctly as tactile sensations, is the certitude of being threatened with an accident.

"After having received a sound-warning, I know with certainty that I have an obstacle before me, and that is why I feel a tactile sensation of grazing on my face.

"The certitude of an imminent danger causes a reflex reaction which manifests itself in the form of a tactile sensation on the surface of the skin."

IF there existed a blind person who had never collided with any object, he would have no knowledge of these sensations on his cheeks, Dr. Dolansky concludes, just as a person who has never known fear can not realize what is meant by "goose-flesh." There now only remains, he says, to explain briefly the manner in which the tactile sensations are produced:

"On the surface of the body, beside the fatty glands, and those of perspiration, hair follicles are placed obliquely. At their bases are attached contractible muscular fibers communicating with the nerves. Under the action of certain nervous currents occasioned by fear, the muscular fibers contract and the hair rises perpendicularly to the surface of the skin, which gives us the impression of tingling, of a cold touch on the cheeks, and in moments of terror, the feeling that the hair stands up on end. This shudder of terror is considered to be a vestige of the instinct of our hairy ancestors, who bristled at the sight of an enemy and who thus took on a formidable aspect. A cat attacked by a dog bristles in the same way, likewise a dog or a horse which has smelled a wolf.

"Thus an affirmative answer must be made to the question whether the blind are endowed with a sense of obstacles. It is a structural mechanism founded on the instinct of self-preservation, and with hearing as its mainspring. As to the sensation of grazing or rustling over the face which appear after the reception of the sound warning-signals, they are the result of a reflex physiological process.

"In exceptional cases, hearing may be replaced by smell or by a sense of vibration."

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